



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/759,018	01/12/2001	Eric Vance Kline	FIS920000310US1	1799

32074 7590 05/12/2005

INTERNATIONAL BUSINESS MACHINES CORPORATION  
DEPT. 18G  
BLDG. 300-482  
2070 ROUTE 52  
HOPEWELL JUNCTION, NY 12533



EXAMINER

PATEL, ISHWARBHAI B

ART UNIT PAPER NUMBER

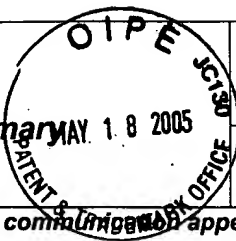
2841

DATE MAILED: 05/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

RECEIVED  
MAY 19 2005  
OIPE/JCWS

**Office Action Summary**



Application No. 09/759,018	Applicant(s) KLINE, ERIC VANCE	
Examiner Ishwar (I. B.) Patel	Art Unit 2841	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 February 2005.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) 1-3 and 14-37 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 4-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 April 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Claim Objections***

1. Claims 9 and 12 are objected to because of the following informalities:

Regarding claim 9: The recitation "said composition is said organic package" is unclear. For the examination purpose it is considered as "said composition is in said organic package", which a person of ordinary skill in the art would have considered.

Regarding claim 12: The recitation "said composition is said printed circuit board" is unclear. For the examination purpose it is considered as "said composition is in said printed circuit board", which a person of ordinary skill in the art would have considered.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Art Unit: 2841

3. Claims 4 and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Berger, (US Patent No. 4,030,948).

**Regarding claim 4**, Berger discloses an electronic device having an integrated circuit (semiconductor element 10, figure 1 and 2) with a composition, said composition comprising: a matrix material (polyimide compositions); a polymer which serves as an insoluble (conformal coating which is impermeable to moisture, column 3, line 46-60) and an immobile phase (polyimide particles in the composition are immobile) in said matrix material (polyimide composition); and a chelating agent (amines, described in detail on column 5, line 1 to column 8, line 33) which is bonded to said insoluble and immobile phase (polyimides).

**Regarding claim 5**, Berger further discloses said composition is a scratch coat (34, figure 1 and 2) covering an active surface of said integrated circuit.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 4-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Raiser et al., (US Patent No. 6,700,209), in view of Berger, (US Patent No. 4,030,948).

Regarding claim 4, Raiser et al., in figure 1, discloses an electronic device having an integrated circuit (12), mounted on substrate 12, but fails to disclose the integrated circuit with a composition for containing metal ions, said composition comprising: a matrix material; a polymer which serves as an insoluble and an immobile phase in said matrix material and a chelating agent which is bonded to said insoluble and immobile phase.

Berger discloses an electronic device having an integrated circuit (semiconductor element 10, figure 1 and 2) with a composition, said composition comprising: a matrix material (polyimide compositions); a polymer which serves as an insoluble (conformal coating which is impermeable to moisture, column 3, line 46-60) and an immobile phase (polyimide particles in the composition are immobile) in said matrix material (polyimide o compositions); and a chelating agent (amines, described in detail on column 5, line 1 to column 8, line 33) which is bonded to said insoluble and immobile phase (polyimides), in order to have a protective coating to improve the functioning of the integrated circuit and to avoid degradation of electrical properties, with various physical and chemical properties as described on column 3, line 45 to column 4, line 14.

A person of ordinary skill in the art at the time of applicant's invention would have recognized the advantage of using the composition as protective coating, in order to improve the functioning of the integrated circuit and to avoid degradation of electrical properties.

Therefore, it would have been obvious to a person ordinary skill in the art at the time of applicant's invention to provide the integrated circuit of Raiser et al., with coating compositions as claimed, as taught by Berger, in order to improve the functioning of the integrated circuit and to avoid degradation of electrical properties.

**Regarding claim 5**, the modified package of Raiser et al., further discloses said composition is a scratch coat (34, figure 1 and 2 of Berger) covering an active surface of said integrated circuit.

**Regarding claim 6**, the modified package of Raiser et al., discloses all the features on the claimed invention including a package (see figure 1) to which said integrated circuit is bonded, as applied to claim 1 above.

**Regarding claim 7 and 8**, Raiser et al., further discloses encapsulant (24, 38) deposited substantially an entire surface of said integrated circuit and between said integrated circuit and said package, see figure 1, but, fails to disclose said encapsulant is made of said compositions.

Berger discloses the coating material with said composition as a coating material for getting the desired property to avoid undesirable degradation of electrical properties of the semiconductor device.

A person of ordinary skill in the art would have recognized the advantage of providing coating material with the composition having chelating agent to have desired

Art Unit: 2841

property to avoid undesirable degradation of electrical properties of the semiconductor device.

Further, it has been held to be within general skill of a worker in the art to select a known material on the basis of suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to provide the modified package of Raiser et al., with the encapsulant / underfill, as claimed in claim 7 and 8, having the composition with chelating agent to avoid undesirable degradation of electrical properties of the electronic device.

**Regarding claim 9**, the modified structure of Raiser et al., discloses all the features of claimed invention, as applied to claim 6 above, but fails to disclose said package comprises an organic package and wherein said composition is in the said package. Raiser et al., does not disclose the details of package substrate 14 or the printed circuit board 22.

Burger, in an embodiment, figure 5, discloses a substrate made of resin, which is an organic material and the composition 160, is contained within the package.

As disclosed by Burger, the use of organic package is well known in the art, as economical and commercially available.

Further, it has been held to be within general skill of a worker in the art to select a known material on the basis of suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to provide the package of Raiser et al., made of organic material with the composition in said package, as taught by Berger, to have the desired properties to avoid undesirable degradation of electrical properties of the semiconductor device.

**Regarding claim 10**, the combination of Raiser et al., and Berger further discloses the device further comprises a printed circuit board (Raiser, 22, figure 1).

6. Claims 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Raiser et al., and Berger, as applied to claim 10 above, and further in view of Ikeda et al., (US Patent No. 5,973,930).

**Regarding claim 11**, the combination of Raiser et al., and Berger, discloses all the features of the claimed invention, including the printed circuit board, but fails to disclose an underfill deposited between said package and said printed circuit board.

Ikeda et al., in figure 1, discloses a semiconductor device with underfill (7) between the package and the printed circuit board (9), to disperse the stresses caused by the difference in thermal expansion, (column 4, line 4-8).



A person of ordinary skill in the art would have recognized the advantage of providing underfill between the package and the circuit board to disperse the stresses caused by the difference in thermal expansion.

Therefore, it would have been obvious to a person of ordinary skill in the art to provide the combination of Raiser et al., and Berger, with the underfill deposited between the package and the circuit board, in order to disperse the stresses caused by the difference in thermal expansion.

**Regarding claim 12**, the combination of Raiser et al., Berger and Ikeda et al., discloses the composition is in said printed circuit board, as applied to claim 9 above.

**Regarding claim 13**, the combination of Raiser et al., Berger and Ikeda et al., discloses the composition is a conformal coating which is deposited over said integrated circuit, said package and said printed circuit board, as applied to claims 4, 6 and 12 above.

### ***Response to Arguments***

7. Applicant's arguments filed on February 1, 2005 have been fully considered but they are not persuasive. Applicant argues that Berger teaches a coating which is admixed with a chelating agent.

Regarding claims 4-13, the applicant argues "(T)here is no disclosure in Berger for a matrix material containing a chelating agent bonded to an insoluble and immobile phase. Accordingly, the Berger coating could be attached by the environment causing components of the coating and the chelating agent to be leached out, thereby depleting the ability of the coating to complex with metal ions". This is not found persuasive. The diamines of the Berger have become a part of the composition (column 4, line 34-40) and the polymer function as an immobile phase. Further, Berger et al., on page 3, column 3, line 45-60, recites that the coating material will have several desirable physical characteristic, such as impermeable to moisture (which implies that it is insoluble), must not degrade, and should adhere very tenaciously to the surface on which it is applied.

### ***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Amami et al., US Patent No. 6,429,382, recites that capturing eluted metal ions by addition of an ion capturing agent such as ion-exchange resin or a chelating agent is known in the art, column 2, line 28-32.

Art Unit: 2841

9. Applicant's amendment necessitated the new explanation / ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

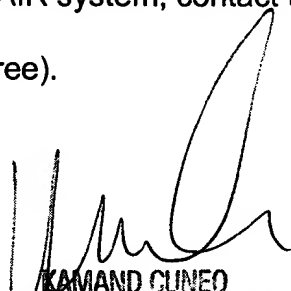
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ishwar (I. B.) Patel whose telephone number is (571) 272 1933. The examiner can normally be reached on M-F (8:30 - 5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo can be reached on (571) 272 1957. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2841

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Ishwar (I. B.) Patel  
Examiner  
Art Unit: 2841  
April 16, 2005

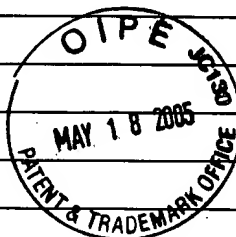


**KAMAND CUNEO**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 2800**

<b>Notice of References Cited</b>	Application/Control No. 09/759,018	Applicant(s)/Patent Under Reexamination KLINE, ERIC VANCE	
	Examiner Ishwar (I. B.) Patel	Art Unit 2841	Page 1 of 1

**U.S. PATENT DOCUMENTS**

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
	A	US-6,429,382	08-2002	Amami et al.	174/259
	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			



**FOREIGN PATENT DOCUMENTS**

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

**NON-PATENT DOCUMENTS**

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

\*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)  
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

IF UNDELIVERABLE RETURN IN TEN DAYS  
OFFICIAL BUSINESS

AN EQUAL OPPORTUNITY EMPLOYER

UNDELIVERABLE  
AS ADDRESSED  
NO FORWARDING  
ORDER ON FILE

**RECEIVED**  
MAY 18 2005  
USPTO MAIL CENTER

